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The following workshop presentations consider learning disabilities: "Educational Goals of the Perceptually Handicapped" by Marianne Frostig, "Remediation of Reading Problems" by Gilbert Schiffman, "Early Identification of Learning Disabilities" by Katrina de Hirsch, and "What Are Some Speech and Hearing Considerations? by John Irwin. (JD)

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INDIVIDUAL LEARNING DISABILITIES

WORKSHOP PRESENTATIONS

ROCKY MOUNTAIN EDUCATIONAL LABORATORY

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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NOVEMBER 1967 WORKSHOP PRESENTATIONS

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The following presentation in the field of Individual Learning Disabilities was given at the teacher training workshop conducted in November of 1967 by the Rocky Mountain Educational Laboratory. Each consultant's report was transcribed for presentation in the workshop report. There was no editing on the part of the Laboratory. We hope these reports will be of value to you and your school system.

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EDUCATIONAL GOALS OF THE PERCEPTUALLY HANDICAPPED

MARIANNE FROSTIG

Training of the educationally handicapped child is difficult. Even the normal child gets confused at times because he has to learn to master so many new tasks, to learn to perceive and communicate with his environment, and to form the many concepts demanded by his culture. For instance, even children of normal mental capacities struggle with such basic but abstract concepts as space and time.

The concept a person has of himself, his self-image, lies at the very root of all other understanding. Carl Rogers explored the connection between self-image and culture during the annual conference of California School Psychologists and Psychometrists.[1] He speaks of culture as a way of gaining insights into what we were, what we are, and what we could be, and thus likens culture to the self-image. The analogy is pregnant with meaning when we consider the present strife in the ghettos and the despair of minority groups because the people involved have lost their self-image, their culture in Roger's sense. Teachers have to help children of minorities or the underprivileged find out who they are so that they can regain their culture and self-image, their identity and values. Nothing is as important in the education of these children as helping them acquire better self-images, to aid them in combating their paralyzing feelings of worthlessness. Before children can develop optimally they must know who they are and what they can be. They must know that they are valued and trusted children with future opportunities for self-realization. Teachers must strive for the same spirit Sylvia Ashton Warner displayed in her work with Maori children, as they helped them to become happy and fulfilled and proud of who they were.

Some trends which call themselves scientific are deplorable because they tend to harm the self-image. Recommendations purportedly based on learning theory have been made that children should be forced to read or learn other skills by means of negative reinforcements (being screamed at, shaken, starved, etc.). These methods have no place with any child, especially not with children who have learning difficulties, most of whom already have poor self-concepts.

The goal of education should be the development of a person who is competent, self-assured, and loving. Putting a child under noxious pressure will not lead to this goal. Rather, education must foster, demonstrate, and reward the positive elements of a child's self-image. Eli Bower expresses this point of view when he writes[2] that the three things we must bring into education are knowledge, love, and the courage to use both.

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1 *Rogers, Carl R. "A Plan for Self-directed Change in a School System." Beyond the Crisis Level: The Preventive and Developmental Aspects of School Guidance.* Proceedings of the 18th Annual Conference of the California Association of School Psychologists and Psychometrists, San Francisco, California, March, 1967, pp. 1-12.

2 Bower, Eli M. "Prevention Re-examined, or Crossing the Bridge Over the River Kwai." *Beyond the Crisis Level: The Prevention and Developmental Aspects of School Guidance.* Proceedings of the 18th Annual Conference of the California Association of School Psychologists and Psychometrists, San Francisco, California, March, 1967, pp. 41-50.

With regard to the practical application of this postulate in the classroom or tutoring situation, Dr. Walcott Beatty[3] stated that it is necessary to use reinforcement to get the child to the place you want him. I agree with Dr. Beatty. His point of view and Bower's and Roger's are not contradictory: reinforcement can take many forms. Beatty does not believe that behavior is under the control only of outside stimuli; there are important inner stimuli, such as the joy of discovery, the knowledge that the work has been done correctly, etc. Such knowledge promotes self-acceptance, which is the basis of "knowing who one is" in Roger's sense.

All teaching techniques should serve the above goals, and any techniques I demonstrate must be viewed in this light. Whatever we teach must also help the child feel better about himself and become more secure. While we train the child in a certain ability, we also try to help him to become more self-directing, more aware that he can master his environment. We may help him to react faster, to become more attentive, or to become better at remembering things. The main goals are always the same: to make the child self-aware, proud of himself, self-directing, and more effective.

LECTURE

Visual perceptual testing and training is comprised of 5 perceptual and perceptuo-motor abilities: training in eye-motor coordination, recognition of form (constancy), of figure-ground perception, of perception of position in space, and of the perception of spatial relationships. These perceptual abilities have relevance for academic learning.

Each of these skills is assessed with the Development Test of Visual Perception and their development is covered in the training materials, the ditto sheets and the workbooks.*

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3 Beatty, Walcott H. "Methods of Counseling: 'Helping Relationship' versus 'Reinforcement.'" *Beyond the Crisis Level: The Prevention and Developmental Aspects of School Guidance.* Proceedings of the 18th Annual Conference of the California Association of School Psychologists and Psychometrists, San Francisco, California, March, 1967, pp. 51-59.

* Frostig, M., Lefever, D. W., and Whittlesey, J.R.B. *The Marianne Frostig Developmental Test of Visual Perception,* Third edition, Palo Alto, California: Consulting Psychologists Press, 1964.

Frostig, M. and Horne, D. *The Frostig Program for the Development of Visual Perception* (Pictures by Bee Mandell), Chicago, Illinois: Follett Publishing Company, 1964.

Frostig, M., Miller, A., and Horne, D. *Teacher's Guide to Beginning Pictures and Patterns.* Chicago, Illinois: Follett Publishing Company, 1966.

Frostig, M. and Horne, D. *Teacher's Guide to Intermediate Pictures and Patterns* and to *Advanced Pictures and Patterns.* Chicago, Illinois: Follett Publishing Company, 1967.

The suggestions in the Teacher's Guide to the Program and to Pictures and Patterns must be followed. That means that the physical education exercises, manipulatory tasks, and the many other activities mentioned in the Guide are as important as the worksheets themselves. Using the total program is necessary because perceptual skills have to be integrated with many other skills also. Good visual perception does not for instance, guarantee good reading. We must be able to discriminate between letters—that means to perceive them correctly—in order to be able to read. But the discrimination of letters alone would permit us only to sort them into boxes, not to read them. The Teacher's Guides, therefore, indicate that the use of the worksheets must include language training and the training in concept formation.

A question frequently asked is how to administer visual perceptual training to a whole class. I suggest the following:

1. Use a transparency projector, discuss the Frostig sheet, have one child demonstrate on a cellophane sheet while other children watch the screen, then turn off the light of the projector and have the children do their own sheets.

2. When they have completed their sheets, have them hold them up so that the teacher can see immediately if the sheets have been done correctly.

The following methods will help children who make mistakes in working with the sheets:

1. Let the child repeat the work on a plastic overlay. Another child may help him.

2. Let the child trace over the correct work with crayons of many colors, i.e., "rainbow tracing" for overlearning.

3. If necessary cut out in construction paper the shape which the child has to find.

Originally, the program for the development of visual perception was published in five sections, each section composed of training exercises for one of the skills tested with the five subtests of the Developmental Test for Visual Perception: eye-motor coordination, figure-ground perception, constancy of form and size, perception of position in space, and spatial relationships. Each of the five sections consisted of subsections with exercises progressing from very easy ones to more difficult ones in each sub-section.

More recently Follett has published the Frostig Program in a new form called *Pictures and Patterns*, which is especially designed for preventive or general developmental purposes. The worksheet exercises are the same in both versions, but the Teacher's Guides are different and the arrangement is different also. In *Pictures and Patterns* the worksheets are bound in three workbooks, one for beginning, one for intermediate, and one for the advanced level, roughly corresponding to the nursery school-kindergarten level, the kindergarten-first grade level, and the first-second grade level. The exercises are roughly in ascending order of difficulty in these workbooks but the five areas are mixed together instead of being separated as in the original version.

The worksheets are concerned with perception in two-dimensional space. The training of perception in regard to a plane surface is very important because it is required in all paper and pencil work. A child who cannot recognize and reproduce written symbols or letters or numbers is handicapped.

Training with worksheets is only a part of the visual perceptual program. The Teacher's Guide to the Program states clearly that the two-dimensional work should be proceeded and accompanied by sensory-motor training, but activities with three-dimensional materials, and by all other activities mentioned in the Guide. We usually suggest that there should be at least two weeks of work with these materials preceding the use of the worksheets in kindergarten and there may be many months of introductory work in nursery school.

Using the ditto sheets or workbooks without carefully following the instructions in the Teacher's Guides and without using the total program will still lead to progress in perceptual skills used on a two-dimensional worksheet, but will not necessarily transfer to school learning. Let me illustrate this assertion with an analogy. A man was very unhappy because he needed a house but had no bricks to build it. Another kind man gave him bricks but the man still could not build the house because he did not know how to join the bricks and erect the building. Perceptual experiences are the bricks for all learning, but to build the edifice of learning we have to know how to use the bricks or we cannot erect the building.

Visual perceptual training needs to be integrated with training of certain language and motor functions and the development of thought processes to affect school learning. This does not mean that perceptual training is not helpful. Perception is necessary for any action and reaction to the environment but it is only one of the foundations of learning.

You remember I stated that visual perception does not occur isolated from other human abilities. You will see in our demonstration that sensory-motor functions and language and thought processes are integrated with the visual perceptual training. We attempt to facilitate the integration of these abilities with our program. For example, the worksheets involve language training because the child must first listen to the story and directions and then translate what he hears into a visual-motor act. This integration of various abilities is essential. In training visual perception, other sense modalities and motor activities should also be considered. As far as visual perception and especially spatial ability is concerned, perception will be enhanced if stimuli are presented simultaneously to other sense channels.

DEMONSTRATION

(The following paragraphs in this section present a description of Dr. Frostig's demonstration offered to the trainees in the training session.)

Dr. Frostig demonstrated her techniques with three children at this point, using the overhead projector so that the child's work could be observed as he completed the sheet.

The children drew lines to represent runways for planes, an exercise for hand-eye coordination. Rich language experiences were developed. The next sheet demonstrated the skill of recognizing position in space.

During the demonstration Dr. Frostig showed how to use cut-out overlays for correcting the children's mistakes. The children can immediately see the differences between the correct and incorrect solutions. Dr. Frostig states that it was necessary always to have the children make circles counter-clockwise; this helps them to connect letters correctly in cursive writing.

Another worksheet for development of hand-eye coordination was given to the children. They were rewarded by receiving a stick of red candy when they had followed a road to the candy stick.

While the children worked with the candy stick picture sheet, Dr. Frostig demonstrated how to stress the use of complete sentences by specifically praising the child for practicing them. Dr. Frostig emphasized that the children should always work from left to right.

CLASSROOM MANAGEMENT

Two suggestions for classroom management of particular importance are to structure the classes so that they are not always teacher-centered, and to have children work in small groups with each other. Children can, for instance, work in groups on a common project to reinforce concepts which had previously been presented by the worksheets. For instance, they may draw flowers different from those on the sheets, showing flower stems and leaves and labeling these parts. In this way they can integrate and practice information recently learned. One child may be able to write sentences of what he knows about flowers; another one may read the sentences of what he knows about flowers; another one may read the sentences; another one may draw flowers; another may cut out flowers, etc.

To use another example: A worksheet showing airplanes and runways had been used. Afterwards, one child in the group could study other pictures of planes landing and taking off. Another one could read about planes while the teacher wrote a paragraph on the purpose of control towers. This paragraph would then be read by whoever found a picture that matched the teacher's story, and so on.

Whenever children work in committees or small groups, noise cannot be completely avoided. The children, however, soon learn to ignore the noise from other groups, although they have to be reminded to keep their voices down so as not to disturb each other. Interchange of ideas and discussion of the work is most important.

A regular class of sixth-graders was observed working on a project dealing with crude oil. There was only a resource teacher in the room (a trainee) to help them when needed. There were five tables loaded with books, with six youngsters sitting around each table. One youngster at each table was "in charge." He helped the others find words in the dictionary. Each of the children

made excerpts from different books, describing various aspects of the topic, such as the origin of crude oil on the organization of the oil industry. They were to note the facts they found in a large book and then write reports cooperatively. One youngster was making borders on the book-cover with circles and squares. This youngster had a hard time making these patterns; his peers had recognized his need for such tasks, and so had requested him to do so. The other children were unaware that this child was brain-damaged, but had found out that he couldn't do these things and so had decided that this was what he "needed to learn." They were most supportive and very complimentary about his good work.

Teachers can learn much from the indispensable help of their young colleagues. The best teacher is one who has 30 assistant teachers in a class of 30 children.

THE IMPLICATIONS OF THE DEVELOPMENTAL SEQUENCE FOR TRAINING

As the child grows up, certain psychological abilities develop maximally during certain phases. The first of these phases is called the sensory-motor phase. The sensory-motor phase lasts from birth to about two years of age. During this time the child becomes aware of the world around him. He learns to move and to move objects. He learns to differentiate between himself and the environment. During the next phase, the language phase, which lasts approximately from about 1½ years of age to 3 or 4 years of age, the maximum development of language takes place. During this phase the child learns to use all forms of speech, learns to express himself in terms of the past, the present, and the future concerning things which he feels and when he perceives or imagines. After the language phase and overlapping with it, visual perception develops maximally. The child learns to perceive things in a two-dimensional plane and uses perception as the main approach in understanding his environment. At about 7½ years or even earlier, the development of thought processes sets in. The child begins to ponder about things and to judge them.

Learning disabilities may occur because of deficits or disturbances in any psychological functions—sensory-motor abilities, language, auditory or visual perception, thought processes, or emotional and social development. Because of the wide variety of disorders, training must be individualized.

Figure I shows the psychological test profiles of two children, one of them has disabilities in the visual channel and the other in the auditory. The child with difficulties on the Frostig Developmental Test of Visual Perception is also low on visual-motor sequencing and visual-motor association on the Illinois Test of Psycholinguistic Abilities (ITPA).

The child who has difficulty in auditory perception (as shown by the Wepman Test), also shows scores below average in the auditory-motor sequencing, auditory-motor association, auditory-vocal automatic, and auditory decoding subtests of the ITPA. The child with poor auditory discrimination is lower in the verbal portion of the WISC, and the child with poor visual perception is lower in the performance portion.

In teaching new materials and skills, we make use of the child's best abilities, while at the same time training him in the area or areas of deficit. When possible, children with similar difficulties are grouped together, and methods of teaching academics are chosen for them according to their common deficits and strengths.

SOME SUGGESTIONS FOR TEACHING READING

With some children who have great difficulties in learning to read, a labeling or matching method is used first; this involves matching words with pictures. Later we may use Lillian Moore's *Easy Readers,* Dr. Seuss' books, or other easy materials, with about 75 to 150 different words in each book, and also preparing questions the children are to answer after they have read the whole book or parts of it. These questions depend on the specific reading abilities which the child needs.

A sheet with questions and exercises are pasted in the inside book cover. The teacher then constructs preparatory stories using no more than 10 to 20 new words in each story, types them, and also reads each of them on to a tape. The child listens to the tape first and then reads the story while listening to the tape. The child reads the story again without the tape and answers questions. In this way the child overlearns the vocabulary. He gets the whole book (such as the *Easy Reader*) only after he has learned its vocabulary while using the preparatory stories and exercises on the tape recorder. This method helps the child to integrate sound and printed symbols, to practice the specific reading skills he needs, and to overlearn the vocabulary.

Many other reading methods based on the abilities and disabilities of the individual child are used at the Center, but only very few can be discussed here. All sorts of different stories should be used, so that the children's experiences are varied. With emotionally disturbed children and beginning readers we try to build a story around the experiences of the individual child. In these cases we give each child at least 15 minutes of individual work during the hour of remedial training.

Writing this synopsis Dr. Frostig wants to thank again the staff of the Rocky Mountain's Laboratory for the pleasant accommodations and warm reception she received.

NAME: Helda:●●● Harna: — BIRTH DATE: 1/31/59 10/14/59 C.A.: 7.4 6.6 DATE:

SUBJECT CATEGORY	TEST	VISUAL PERCEPTION					AUDITORY PERCEPTION	WECHSLER INTELLIGENCE SCALE FOR CHILDREN											I.T.P.A.									
		I	II	III	IV	V	WEPMAN	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	VII	II	VI	III	IX	V	VIII	IV	I
		EYE MOTOR COORDINATION	FIGURE GROUND	FORM CONSTANCY	POSITION IN SPACE	SPATIAL RELATIONS		INFORMATION	COMPREHENSION	ARITHMETIC	SIMILARITIES	VOCABULARY	DIGIT SPAN	PICTURE COMPLETION	PICTURE ARRANGEMENT	BLOCK DESIGN	OBJECT ASSEMBLY	CODING	AUDITORY-VOCAL AUTOMATIC	VISUAL DECODING	MOTOR ENCODING	AUDITORY-VOCAL ASSOCIATION	VISUAL-MOTOR SEQUENCING	VOCAL ENCODING	AUDITORY-VOCAL SEQUENCING	VISUAL-MOTOR ASSOCIATION	AUDITORY DECODING
ADEQUATE OR ABOVE												15																
TRAINING NEEDED		12 8 7 8 10 6 10 6 11 6					— ●●●	7 10 4 6 9 8 8 7 15 4 10 6 9 7 12 7 7 8 10 6											.14 -3.00 .59 -.14 -1.39 .27 -3.05 .55 -1.10 -1.84 -.30 -1.85 -.20 -2.47 -.74 -1.78 .11 -2.05									
DATE GIVEN		4/66 a.e. s.s.						4/66											4/66 s.s. l.a.									

	Helda	Harna		
Perceptual Quotient =	105	67	Actual Grade =	Sensory Motor Development ITPA Total Language Age =
Verbal I.Q. =	74	99	Arithmetic =	
Performance I.Q. =	100	76	Spelling =	
Full Scale I.Q. =	85	87	Reading =	

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REMEDIATION OF READING PROBLEMS

GILBERT SCHIFFMAN

The basic responsibility of the public school is to attempt to educate each pupil to the full extent of his capacity. In order to carry out this philosophy, it is necessary to provide special services and programs for pupils with problems which cannot be served within the regular classroom program. For a multitude of reasons, there are pupils within any system who are not reading at a level comparable to their capacity. Ideally these pupils would be identified and remediated in the regular classroom by proper grouping and instruction. However, from experience we know this is not always possible or practical. For many of these children it is necessary that special reading programs be available at the elementary and secondary level to supplement the developmental program. Emphasis should be placed upon early identification and placement in the proper program before an individual's problem has become too complex.

A number of years ago educators realized that a total school reading program must involve three kinds of reading: developmental, corrective, and remedial. Perhaps we should digress for a moment and briefly define the three types. First, the developmental phase involves systematic instruction at all school levels and in all content areas for those who are developing language abilities commensurate with their general capacity levels. This developmental phase is the responsibility of every teacher, affects all the pupils, is provided for in the regular curriculum and is a continuous ongoing process. Secondly, the corrective phase of reading must deal with those pupils who are able to comprehend the assigned material only after undue and laborious effort. Many difficulties involved are those common to all pupils in reading, but are greatly accentuated.

Fernald calls them "cases of partial disability." She feels that "these cases usually develop normal reading skills when they are given the opportunity to learn by ordinary methods after the faculty conditions (poor vision or hearing, illness, emotional instability, or lack of adequate schooling) have been removed."

Vernon classifies this group as "backward readers" or "semi-illiterates."

Johnson states that a corrective case is "a case of reading retardation not complicated by neurological difficulties, deficiencies in associative learning, and so on." She feels that these cases may result from "lack of readiness when initial experiences with reading were provided, continued instruction above the proper level, lack of adequate stimulation in instruction, inadequate background of experience or oral language facility, and so on." The important thing is that these cases do not usually require clinical instruction unless the retardation is compounded by continued inattention to correction and attendant emotional complications.

Most of the corrective instruction is the responsibility of all teachers in their daily class activities.

Remedial reading programs are essentially clinical programs for children with severe reading difficulty who are unable to make associations between visual (printed) symbols and their experiences.

Many authorities have called to attention, as though they were diagnostic of specific reading disability, such phenomena as: reversals (was for saw, gril for girl), mirror writing, confusion of certain letters (b, d, p, q), omitted or added words, perseverations, skipped or repeated lines, and the like. These very same errors occur as the normal child learns to read; what distinguishes the remedial reader is the frequency and persistence of these errors well beyond the time at which they have become uncommon in the normal.

Other labels for this category are specific reading disability, congenital word blindness, primary reading retardation, development dyslexia, and language disorders. The adjective "specific" calls attention both to the circumscribed nature of the disability and to our ignorance of its cause.

Specific reading disability may be defined as the failure to learn to read with normal proficiency despite conventional instruction, a culturally adequate home, proper motivation, intact senses, normal intelligence, and freedom from gross neurologic defect. Pupils with these problems demand individual and small group instruction on a clinical basis by specially trained personnel. It is for these that the tactile and kinesthetic techniques are usually necessary.

The identification and remediation of these learning problems presents a real challenge to educators; children with such disabilities are high risk candidates for long-term school difficulties in both academic achievement and school adjustment. Whereas achievement tests and group intelligence tests often place them in the borderline or defective intelligence categories, careful individual mental ability testing with appropriate clinical instruments often reveals normal intelligence or higher. In many instances, the problems presented by such youngsters are of such a complex nature that various other professions may be involved including a psychologist, psychiatrist, pediatrician, neurologist, and social worker.

Within the past decade there has been increasing interest and focus upon the various possible contributing factors to learning disabilities. It may be safely stated that the present state of knowledge and understanding of these problems, as well as agreement among the various disciplines involved, is far from satisfactory.

It is a matter of some considerable importance to establish the cause or causes of learning problems including reading disabilities as accurately as possible. For example, there is still a substantial pedagogic tradition which holds that all such academic failures are due to poor teaching. If this is so, then steps need to be taken to assure that such pedagogic measures are corrected. If these learning problems are the result of intrapsychic stress, resulting from aberrent child rearing practices and parent-child conflict, then clearly child guidance workers have a central role to play in both treatment and prevention.

Of considerable current interest is whether minimal brain dysfunction might exist in some of these children. In this context the term minimal does not refer to a necessarily minor or unimportant impairment but rather to (presumed) neurological involvement which is not readily and grossly demonstrated. The diagnostic and descriptive categories included under the term minimal brain dysfunction refer to children of near intelligence, average or above-average general intelligence with learning and/or certain behavior abnormalities ranging from mild to severe, which are associated with subtle deviant functioning of the central nervous system.

These may be characterized by combinations of deficits in perception, conceptualization, language and memory and control of attention, impulse or motor control.

These aberrations may arise from genetic variations, biological irregularities, perinatal brain insults, illness or injuries sustained during the years critical for the development and maturation of the central nervous system or from unknown cause. During the school year a variety of special learning disabilities are the most predominant manifestations. Our interest in children with learning disabilities derives from a 10-year experience in an interdisciplinary diagnostic clinic (Central Evaluation Clinic for Children, University of Maryland Hospital) where we have had the opportunity to study large numbers of children referred because of school failure. In this setting each child is studied thoroughly by a pediatrician, neurologist, psychologist, audiologist, and speech pathologist. Electroencephalograms are obtained routinely; psychiatric and special educational consultations are freely utilized. Working in such an interdisciplinary setting the staff has a unique opportunity to gain firsthand experience with school problems, to exchange ideas with the several disciplines involved and to cultivate an interdisciplinary exchange of information and ideas. It has also been possible to view in broad perspective some of the conflicting viewpoints and interpretations of the existing body of knowledge about children with various kinds of problems in school adjustment and academic achievement.

It is not an infrequent occurrence that the same child will be given diagnostic labels which are seemingly at considerable variance when studied in different clinical settings. An example of this occurred recently in Baltimore when a seven-year-old boy was studied in three highly regarded centers within a period of several months. In one clinic he was called neurologically impaired with an aphasio aphasoid central language problem. In another he was diagnosed as schizophrenic; in the third he was called chronic brain syndrome with organic hyperkinetic behavior disorder. The reasons for such semantic confusion and apparent difference of opinion are not difficult to discern since the child had multiple problems. Each consultant labeled the boy according to the major problem as he perceived it. Without attempting judgment about the accuracy of any of the diagnostic terms used, it does seem appropriate to ask if this single example reflects our present state of knowledge and understanding of child development, and furthermore we are aware that such confusion exists.

Out of their experience with large numbers of children who have severe reading problems, the staff of the evaluation clinic is investigating and evaluating the school of thought which holds that there exists within the community of slow learners and poor readers a specific group which has particular difficulty in learning the conventional meaning of symbols, which may be of constitutional and not of environmental origin, and is often genetically determined. The condition is much more common in boys than in girls, may be associated with delayed determination in handiness, motor awkwardness and directionality confusion. Detailed family history frequently reveals a similar reading, speech, or language problem disorder among near relatives.

However, since the group of children studied in the central evaluation clinic for children were a highly selected and screened population which had been referred for evaluation, it was decided to study a large number of children with reading disabilities found in one large public school system. Accordingly, 240 children

with severe reading problems which could not be remediated by supplementary pedagogic methods were studied in an experimental project in an effort to clarify the nature and characteristics of these children.

The average remedial reader found in the study is a male with one sister and one brother who entered the first grade at the chronological age of 5 years 11 months. He has a poor reading readiness score which indicated a delay in the initial reading experience. He is in the sixth grade reading below the second grade level and has repeated somewhat less than one time. He has a severe word recognition problem with a limited sight vocabulary and few work analysis skills to unlock unknown words. His comprehension is very deficient. His health, attendance, and discipline are satisfactory. There does not appear to be any significant Wechsler subtest profile. Spelling achievement scores are below reading and arithmetic achievement grade levels as determined by the Wide Range Achievement Test.

Most observers agree that learning problems are far more common in boys than in girls. In fact, the study of distributions of boys and girls in homogeneously grouped classes reveals the unequal sex distribution in which more boys are in the slower moving groups and more girls are in the faster moving groups. The reason commonly given for this is that child-rearing practices and other social pressures center largely about the role of the male child as the potential primary source of economic support for the family cause emotional problems which lead to his learning problems.

Benson has pointed out that physiological and maturational factors may play an at least equally important role, since the human male organism matures at a slower rate than the female. Thus, she advances the hypothesis that some of the behavior disorders and learning problems among boys may be the result of stress response of an immature organism to the demands of a society which fails to make appropriate provision for the biological age differential:

Direct methods of measuring maturational rates of the central nervous system are lacking, but it is of interest to consider other organ systems in which more precise techniques of assessing developmental maturational processes are available. One such system, the maturational rates of which can be readily measured accurately, is the bony skeleton. It is of interest to note that the secondary centers of ossification appear consistently later in boys than in girls, and that the average difference for those centers appearing between 4 and 12 years of age amounts to 20 months.

If such maturational difference occurs in the central nervous system this would lend additional support to Benson's hypothesis that biological and physiological differences between girls and boys placed the human male at a disadvantage from the readiness point of view.

It is appropriate and necessary to point out at this time that one of the major problems inherent in the identification of reading disabilities is that traditionally educators, physicians, and other professional workers concerned with the problem have relied almost exclusively upon capacity and achievement scores determined by standardized tests. A severely retarded reader is considered to be a pupil retarded two or more years by standardized tests. This rule of thumb

screening criteria can be dangerous and misleading. Standardized tests of reading achievement do not always indicate the pupil's optimum instructional reading level.

In our study reading achievement scores compiled within a four-month period before instruction was initiated demonstrated the wide variation between standardized and informal tests. There appears to be about a two-year difference between the standardized and informal evaluation.

The picture is just as confusing concerning capacity evaluations. Most of the measuring instruments are tests that require reading: yet often they are given to students who cannot read or have not learned to read effectively. There is considerable variability between the different capacity measuring instruments. There also does not appear to be a typical profile of Wechsler's subtests for these remedial readers. The performance section is significantly higher than the verbal section in many cases. The intercorrelations of these tests and the WISC for the 240 remedial readers were considerably smaller than the Wechsler standardization and expectations. In fact, 20 of the 55 correlations in the study were negative. The factor analysis possibly might reveal some cluster but the present data does not indicate a specific profile.

Psychological testing suggested the possibility of an organic, physiological contributing factor in 70 of the remedial-clinic type of retarded readers. The high incidence of possible neurological disability (as inferred from psychological testing) that appears in the population of the study (29 percent) is not typical of its distribution in the normal population.

Now let us look at an actual school program for these remedial readers.

The elementary child reports to the building at 9:00 a.m. each morning and is picked up at 11:40 a.m. and returned to the regular school for the afternoon session. The parents must provide transportation. The secondary students are picked up at their regular school each day and transported to the clinic by 12:45 p.m. Classes are dismissed at 3:30 p.m. and parents make arrangements to call for their child at that time.

Seven PTA meetings are scheduled during the school year. Three meetings are conducted by the reading clinician who conducts a highly structured PTA meeting. The other four meetings are headed by a visiting teacher trained in Family Life Discussions. The parents have an opportunity to discuss some of the things—either old or new—that have been bothering them. Here the parents see that they are not alone; other parents have similar problems; other children share personality changes. In many cases parents can help each other solve some of these pressing issues. The whole program is conducted in a nondirective, relaxed fashion and acts as a type of catharsis. The psychologist and reading clinician are there as observers, and only join in as consultants when requested by the parents.

Whenever possible the programs are so structured in the local school that the youngsters attend classes and participate in activities requiring limited reading and writing skills. This, of course, is much easier to do in the secondary programs. However, we have found in the fourth, fifth, and sixth grades where reading is conducted in the morning that the pupils can meet success in the afternoon

in some subjects that do not bear directly on the reading area of the language arts program. Ideally, the reading specialist will work with about seven youngsters in both the morning and the afternoon session.

Grouping as far as instruction is concerned is very fluid. It varies with the immediate needs of the individual.

The psychological approach utilizes the tracing or VAKT (Visual, Auditory, Kinesthetic, Tactile) techniques instead of the VA used in the developmental and corrective programs.

Three pedagogical techniques are considered in the remediation of these severely retarded readers. (1) The basal and the language experience approach using V and A. (2) The Fernald approach using VAKT in analytical breakdown. (3) The Gillingham approach using VAKT in a synthesis attack. (Latest research is finding a language experience approach using a modified Fernald with the Stauffer word bank concept most successful.)

For some time, every remedial pupil was exposed to one specific technique. The selection of the particular pedagogical procedure depended to a large extent on the training of the clinician and the bias of the diagnostic center. Educators embrace the philosophy of individual differences, but too often, accept the "one right way" of teaching reading to all retarded readers. Pupils and teachers alike have had to adjust to the one procedure instead of the teacher and the technique adjusting to the needs of the child. Too often teachers have followed one policy blindly because some authority has said, "This is the way."

Experience has demonstrated the fact that there is no magic panacea for all children. These severely retarded readers have one consistent syndrome, besides their retardation, and that is inconsistency. The clinician must select the appropriate technique through diagnostic teaching and use all sensory pathways to reinforce the weak memory patterns. The method or combination of methods that helps the child is the right method.

The program is so geared that the youngsters have a wide variety of high interest, low reading level material with a variety of supplementary material such as tape recorders, filmstrips, slide projectors, hand and eye coordinators, primer typewriters, and listening parts material. During the day, a certain number of youngsters will visit with the psychologists for individual and group therapy.

Extensive studies conducted during the program have attempted to evaluate the effectiveness of remedial reading with psychotherapy in the public school system. Unfortunately, it has been impossible to effectively control the variables for large groups of children and psychologists. The objective evidence at this time is still inconclusive. Nevertheless, many teachers are of the opinion that some therapy or assistance must be given to all severely retarded readers.

The reading teachers in the program have constant conferences either by telephone, letter, or in person with the classroom teacher to integrate and correlate the two programs. The reading teachers also meet with the psychologists to discuss how the youngsters are progressing in the program. Once a month the

entire staff meets in an evaluation program. Whenever the student is academically and psychologically prepared, he is returned to the corrective or to the developmental program. If the youngster is not meeting any success, he may be returned to the local school for further referral, study, and recommendations.

A research study was then designed to compare the reading improvement of (a) remedial pupils who remained in the developmental reading programs, (b) remedial pupils who received corrective reading instruction, and (c) remedial pupils who received remedial reading therapy. The study compared the reading improvement of the three groups of pupils after one year of instruction, and again one year after termination of instruction.

Each of these pupils have the following characteristics in common: (1) Evidence of near average, average, or higher than average intelligence as determined by the WISC. (2) Severe reading retardation with word recognition problems as determined by informal and standardized achievement tests.

The 80 pupils in the corrective program received the standard corrective program at their local schools.

The 80 pupils in the regular developmental program remained in their classrooms and received no additional instruction outside of the normal developmental reading program.

During the 1962-1963 school year the pupils who had been in the remedial and corrective programs returned to their regular classroom developmental reading program.

Reading evaluations were administered at the beginning of the study in September 1961, at the end of the remediation period in June 1962. They were studied at the end of the study in June 1963.

RESULTS

The findings which pertain to the major purpose of the study are as follows:

1. At the close of the one-year instructional program and at the close of one year of follow-up, elementary pupils in the remedial group had made greater improvement in reading than the pupils in the corrective and developmental program. The difference was statistically significant at the one percent level.

2. At the close of the one-year instructional program elementary pupils in the corrective group scored higher in reading achievement than the elementary pupils in the developmental program, and the difference was statistically significant at the one percent level. There was no difference between the corrective and developmental groups at the end of the follow-up year.

3. At the close of the one-year instructional program, secondary school pupils in the remedial group had made greater improvement in reading than the pupils in the corrective and development program. The difference was significant at the one percent level.

4. At the close of the one-year instructional program, the secondary pupils in the corrective group scored higher than the pupils in the developmental group and the difference was statistically significant at the one percent level. There was no difference between the growth of the three groups at the end of the follow-up year.

Since the reading growth of the remedial pupils taking corrective remediation during the 1961-1962 school year was limited (elementary .5 and secondary .69), it was interesting to note that the average growth of corrective pupils receiving the same remediation during the same period was elementary 1.84 and secondary 2.02. It is apparent that the average corrective pupil receiving corrective remediation made a great deal more progress than the average remedial pupil receiving corrective instruction.

SUMMARY

The intent of this paper is not to discuss the value of one particular pedagogical procedure over another, but to stress the point that remedial readers when exposed to corrective procedures do not make really satisfactory permanent growth. These remedial pupils who have failed to progress under ordinary classroom methods must be taught not by repetition of techniques that have failed, but by new ones carefully planned to overcome individual differences. It is not easy to identify these pupils. Standardized tests of achievement and capacity cannot be expected to yield accurate results for children with severe reading problems since a degree of verbal facility is necessary simply to understand testing directions and to read the questions.

The writer does not believe that the schools will ever solve or even contain this serious problem by only the addition of large numbers of reading specialists or diagnostic clinics. This is not to say that skilled reading clinicians are not helpful to a total reading program. However, as the educational staff becomes more sophisticated in identifying children with learning disabilities, waiting lists grow in size and the reading personnel are unable to keep pace with the overwhelming demands for their services. Special reading classes scheduled outside the regular classroom are often too large to provide effective individual remediation. Also, heavy tutorial loads cause some children to be scheduled for reading during times when classroom activities are the most interesting. Overloaded remedial or corrective classes prevent the use of reading specialists as effective resource personnel in helping teachers develop the necessary techniques and attitudes, and in assisting in the planning of effective programs for children with special reading problems.

The answer lies in developing a strong preventive, developmental, and corrective reading program in the local classroom. If this be true, administrators must make sure that they are providing the regular classroom teacher with every advantage, skill, and opportunity to do his job. Teachers must be given class sizes that are small enough to meet individual differences and techniques to adjust the pedagogical procedures to the needs of the child; not the child to the program. Of course, this is easier said than done. With our bulging school population, lack of school plant space and facilities, and large numbers of inexperienced teachers the task seems almost insurmountable. If school personnel recognize the need for small class size, especially in the primary grades, they may be able to alleviate the problem with annexes and/or trailers.

The problem of inadequately trained teachers is more pressing because it involves a serious difference of opinion among educators of teacher training institutions. The argument as to whether or not to emphasize subject matter courses or professional techniques courses has been going on for some time. The subject matter proponents appear to be in the ascendency. Local universities offer the most minimal training in the myriad approaches to the teaching of reading. In fact, a secondary teacher of English or language arts can be graduated from most teacher training schools in the country and never have taken a course in the teaching of reading. The average primary teacher may be required to take one course in the teaching of reading or language arts. Educators must change the requirements and philosophies of the teacher training institutions, if not, then the local school systems must provide an ongoing program of inservice education and curriculum development. In other words, schools will not only need to teach children but also to teach teachers. (Many states are adopting the IRA Reading Specialist Certification requirements.)

Leon Eisenberg makes one final point. Most school systems introduce corrective or remedial reading instruction at the third grade or later (if they have it at all). The justification is usually one of economy. Of those children not reading at the end of the first grade, perhaps half manage to pass muster by the end of the second grade, a few more of the remainder learn to read by standard instruction by the end of the third grade. These children are the "late bloomers," youngsters who, for unknown reasons, acquire late, but do acquire, the capacity to profit from conventional teaching. By waiting until the third grade, the school system has spared itself the cost of extra teaching for children who were going to make it on their own. This "economy," however, must be balanced against the cost to those children who, by the third grade, are deeply imprisoned in faulty learning habits, have become convinced of their ineptness, and now respond poorly to any but the most expert individual clinical instruction. Surely, this country can afford to do better by its children. We would not hear of delaying therapy for rheumatic fever because not every patient incurs heart disease; how then can we tolerate a view that is equivalent to saying: let us make sure the child cannot read and is really in trouble before we can give him extra help? An effective program for early identification and treatment might even produce long-run savings if taken into account the cost of prolonged treatment and ultimate losses in the economic productivity of the handicapped readers. But my argument places no weight on such matters. Where the healthy development of children is concerned, financial considerations are simply irrelevant. The precedent-shattering federal aid-to-education bill recognizes a national responsibility to improve the quality of education; the funds made available are but a token of what will be required ultimately. If we allow them to be used to supplant state funds or merely to be spread thinly throughout the system, no significant changes will result. The best teachers must be attracted to slum areas to work with these disabled readers; class size must be reduced; curricula must be modified.

Many federal and state acts offer financial assistance. In Maryland's handicap laws the following statement is made:

a. The local department of education may provide a special program within the public school system for any child whose specific learning disorder results in such impairment or dysfunction of the intellectual processes that he cannot

benefit from the instructional program usually found appropriate for most children. Specific learning disorders include, for example, problems in reception, formulation, and expression of language; problems in visual perception and integration; and a specific reading disability such as strephosymbolia.

b. Wherever seven of these children who have similar learning disorders can be found, a special class may be formed and a qualified teacher may be employed.

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EARLY IDENTIFICATION OF LEARNING DISABILITIES

KATRINA de HIRSCH

Twenty-five years of experience with intelligent but educationally disabled children has convinced us that a sizable number of them would not have needed years of remedial help had their difficulties been identified before they were exposed to formal education.

What I have to say this morning is based on a longitudinal study concerned with early prediction of reading, writing, and spelling competence. We have a validation study on 500 kindergarten children underway. The subjects of the original investigation were 53 children born on term and 53 prematurely born youngsters all from a lower middle class section of New York City. We excluded from the sample children from bilingual backgrounds, children with sensory deficits severe enough to interfere with learning, such as partially deaf or blind children, those suffering from psychopathology as judged clinically, and those with IQ's above 116 and below 86. At kindergarten age we administered 37 perceptual-motor, oral language and reading readiness tests to all youngsters and correlated performance on these tests with achievement measures in reading, writing, and spelling at the end of the second grade.

I shall now try to describe to you the kindergarten functioning of three groups of children whom we identified on the basis of their reading and spelling scores at the end of the second grade. These groups were: the children who, at the

end of the second grade, excelled in reading and spelling (we call them the High Achievers); the children who had not caught on to reading and spelling by the end of the third grade but who had managed to pass achievement tests at the end of the second year (we named them the Slow Starters); the children, finally, who had totally failed all tests at the end of the second grade (whom we labeled the Failing Readers). Now, how had these three groups functioned before they were exposed to formal education? The focus of our interest was, of course, the failing children. We had established that they did not differ significantly from their peers in intelligence and we asked ourselves: a) Did the failing children of kindergarten age present a specific consternation of dysfunction? b) Was an early pattern of dysfunction predictive of reading or spelling performance as measured more than two years later? In answer to these questions, we turned not only to the children's performance on the 37 tests administered at kindergarten age, but we also looked back to our clinical notes and observations on each of these 53 children, in which we attempted to describe their characteristic style, the way they approached the testing situation, the degree of anxiety they displayed and the way they handled it, their readiness to separate from their mothers, their dependency, their frustration tolerance, the amount of energy they had displayed when faced with the tests, also their cognitive style and the specific pathways they used in their approach to learning tasks.

In our failing group, consisting of three Negroes and five Caucasian youngsters, two years in the elementary grades had made absolutely no impression as far as reading and spelling were concerned. As I look back at our early protocols, I find that five of these children were exceptionally small. It would be silly, in the absence of information as to parental stature to generalize from this observation. However, bio-physical and educational age are closely related. We are constantly amazed at the physiological immaturity of so many of our poor readers and spellers, the children Ilg and Ames call "Superior Immatures."

Six of the failing children were boys. Boys' inferior academic performance in the early grades has been interpreted by each researcher in the light of his particular bias. Some think that boys do not find first grade activities congruent with their masculine role. This is probably true. But we are impressed even more with the fact that at age six, boys lag 12 months behind girls in skeletal age. This would point to important physiological reasons for the boys' inferior performance. There are new studies which comment on neurological immaturity in newborn males. Learning problems in boys, then, may be the response of the immature organism for the biological age difference between girls and boys.

When I look back at the Failing Readers when we first saw them, I remember that they looked confused and bewildered. Many first graders look this way, as if their efforts at finding their bearings took up all of their available energy.

In the profiles we wrote on each child, five of the Failing Readers were specifically described as being infantile. They whined a lot. Two of them had to be taken on the examiner's lap to be able to complete the testing. These five children were as yet unseparated from their mothers. Their dependency needs were considerable. Even those three youngsters in the failing group who were not particularly dependent, who enjoyed the sessions, the toys and the candy we provided, seemed quite unable to focus attention on tasks that did not provide immediate gratification. They had not really made the transition from the pleasure to the reality principle. They had plenty of energy; they played vigorously.

But they were unable to mobilize energy in the service of the more formal task presented. This inability seemed to be but one aspect of a pervasive organismic immaturity, which appeared to go hand-in-hand with their delay in psychic maturation.

In terms of activity level, we found two groups: five of the children were enormously hyperactive, disinhibited, and impulsive; three of them presented the opposite picture. They were hypoactive, and they tended to slump. These are the kind of children that we see in the economically deprived groups.

We didn't find much that was deviating in the failing children's gross motor coordination, which surprised us, because we find these five and six year olds in the clinic who can't hop on one foot or throw a ball, and whose motility patterning is still quite global. If one asks for such children to flex the tongue, they turn the whole head. They show a lot of motor overflow of the kind we see in younger children.

Our Failing Readers' fine manual coordination was quite poor. We make a distinction between nongraphic and graphic motor skills, pencil skills. The latter was abysmally poor in our Failing Readers. They either couldn't hold the pencil at all or they pressed so hard that they tore the paper. One is reminded of Orton's observations as to psycho-motor lags in children suffering from difficulties with spoken and printed language. It was of interest, incidentally, that poor pencil grasp turned out to be predictive, not only of writing, but also of reading, two and a half years later.

Contrary to expectations, ambi-lateral responses at kindergarten age were no more frequent among the Failing Readers than among the High Achievers. In other words, those youngsters who had established a superiority of one hand over the other did not read better at the end of the second grade than those who had failed to do so. Ambi-laterality at this early age, at least, does not preclude adequate performance thirty-two months later.

Differences between good and poor readers were found, however, involving body image as reflected in the children's human figure drawings. The child's ability to draw a man reflects his awareness of the parts of his own body and the relationships of these parts to one another in space. Recently, tests have shown that in ten year old children, failure to discriminate between right and left rather than ill-defined laterality is related to reading failure. Our Failing Readers' human figure drawings were quite fragmented and crude. They revealed deficits in body schema, which would tend to interfere with orientation in space, and thus with reading.

Our poor readers also showed deficiency in visual-motor tasks. They had a great deal of trouble in copying six of the Bender-Gestalt which is required at this age. Their copies were strikingly crude and undifferentiated and showed evidence of spatial disorganization. Interestingly, apart from specific reading readiness tasks, the Bender ranked highest among predictive tests. The auditory-perceptual and oral language tools of the failing readers were quite inferior, as compared to that of the other children. Their way of coming to terms with the work was through action. In the case of deprived children, this wouldn't be surprising because little speech is probably directed toward them. There are, however, youngsters from middle class backgrounds, who, for reasons we know little

about, have enormous difficulties perceiving, processing, and storing information received through auditory pathways.

All language is organized in time. Some of our children have trouble even on a non-verbal level. Verbal comprehension is, of course, a very complex process. It requires, among other things, discrimination of sounds heard; and the auditory perception of many of our poor readers, and above all our poor spellers, is incredibly diffuse. This is particularly true of our hospital group, consisting mostly of Negro children, whose language models are poor. But we see the same phenomena in children from higher economic backgrounds. To such children, words like "pan" and "pin" sound exactly alike. Auditory discrimination continues to mature well into the eighth year of life. But, in severe cases, we find many whose discrimination remains inferior beyond adolescence.

Some of our Failing Readers have very limited vocabularies. Many of them fail to get the gist of a simple story told them. We've only recently started testing children for linguistic competence. We now want to know at what age children understand the difference between such sentences as, "The dog chases the boy" and "The boy chases the dog." The words are the same but these involve comprehension of subject and object. We always test children's understanding of the small grammatical words which represent temporal and spacial relationship like "next to" or "on top of" or "the day before yesterday." We find that some of the failing children show considerable gaps in this area. Trouble with abstract words like "same" and "different" is one reason why some youngsters have such difficulty with reading readiness tests. They may easily be able to match words but they may fail to understand if we tell them to cross out the word that looks the "same."

Expressive language, I mean output, in our failing group is often grossly deficient. A relatively simple indicator of the wealth of a child's verbal output is counting the number of words he tells about pictures when he produces a story.

We originally used *The Three Bears.* It is not a good one, actually. We now use cartoons. The number of words used in *The Three Bears* ranges from 64 to 594, with our Failing Readers being at the lower end of the distribution. That's an enormous range. The richness of the child's verbal output obviously varies with the language stimulation he receives at home. But it is nevertheless impressive how much verbal output may differ in members of the same family.

Only two of our Failing Readers showed defective articulation. Most of them had problems with word finding. They had not been deprived of important life experiences, but they lacked the verbal referents which allowed them to organize and conceptualize these experiences. The child who cannot remember proper names or his evening prayers is the same as the one who is unable to retain the letters of the alphabet. He has trouble with retrieval. I remember a little girl who came to us with poor speech. I sat with her in front of the doll house and she said, "Let's cook." So I said, "All right, let's cook." "Let's make hammelgers." I looked a little perplexed and she got impatient and said, "Never mind, let's make hot dogs." It occurred to me afterwards that she meant "hamburgers," but she couldn't find the word. I saw her again last week. She's now in the fourth grade and she does well, not quite as well in reading as she should in view of her very high IQ. We came to a paragraph where a word appeared she did not know and she said, "It has to do with water, quickly, give me the

word." It was, of course, "irrigation." She knew what it was about. She knew the concept, but she couldn't produce the word. She had trouble with retrieval.

The stories of five of our Failing Readers were poorly organized and quite rudimentary. They were unable to find generic names for individual objects. They couldn't produce the word "food" when asked what is a hamburger, an apple, and ice cream. In short, they showed at kindergarten age numerous and severe oral language deficits. Their deficits were not limited to information transmitted through auditory channels. They had trouble, also, processing visual-verbal information. I'm sure that Dr. Frostig has talked to you about this.

At kindergarten age they didn't respond to what is called the "critical" features of configuration, those features which make the difference between a "t" and an "f." To these youngsters, the configuration on a printed page seemed to shift. One eight year old girl told me angrily that it was as if "ants were running around the page." In trying to select from a number of words, two of which look alike, our failing children behave as if the page presented a scramble of meaningless designs, all looking more or less alike and lacking distinctive physionomic features. Working with such youngsters is a little like trying to print something in very loose sand.

The majority of our children did poorly on both the auditory and visual tasks. Their competence or lack of it cuts through both modalities. But there are always a few children who show what one might call bizarre modality patterns, excellent competence in the visual-perceptual realm and troubles with rhyming and auditory discrimination. Most of these visually gifted children learn to read, but one wonders what their spelling is going to be like in higher grades. A few present the opposite picture; good auditory ability and trouble with visual-verbal perception. These particular children do better in the phonic approach. Our Failing Readers actually did poorly in both, all their perceptions were diffuse, unstable, and undifferentiated.

Bender and Werner have demonstrated that development moves from the unstable and diffuse in the young to more sharply defined in the older child. Our Failing Readers had progressed but little on this road, and in this sense they resembled chronologically younger children.

There was a second group of youngsters in our study; the prematurely born, who, in some instances showed similar developmental delays. Clinically, these premies looked very much like our Failing Readers. They seemed diffuse and quite infantile. Their central nervous system patterning seemed to be quite primitive and they presented deficits in motor, perceptual, visual-motor and integration areas. Deficits which receded—they got much better—were still apparent in the elementary grades in a subtle way. The premies are of interest not only because prematurity is a fact which should be taken into account when it comes to a decision about first grade entrance, but because prematurely born children constitute by definition a group which originally started out life with neuro-physiological lag. Since our Failing Readers resemble the prematurely born in their way of functioning, this might suggest the presence of subtle neuro-physiological lag also in the case of the Failing Readers who were born at term.

Let me now shortly describe the two other groups of children whom we had identified at the end of the second grade on the basis of their achievement scores,

the Higher Achievers of the Slow Starters. When we went back to the Slow Starters' kindergarten protocols, we found no mention of hyperactivity or disinhibition. At kindergarten age they had apparently achieved a measure of behavioral control. Their figure drawings were less crude than those of the Failing Readers, their auditory discrimination less diffuse, their stories less fragmented. They had far less trouble with the organization of the visual field. The Slow Starters, in short, did fairly well in less complex activities. They began to fail when they moved into activities which called for more highly integrated performances, such as the Bender-Gestalt Story organization and most Reading Readiness tasks. The Slow Starters' perceptual motor experiences were better organized, their central nervous system more differentiated, but they did run into difficulties when it came to more differentiated performance. Up to a point, these difficulties persisted. In spelling achievement at the end of the second grade, half of the group remained inferior. A measure of perceptual instability then continued to be a feature of their performance.

The Superior Achievers' test scores constituted the highest 15% of the total sample in reading and spelling. These children—and they were not brighter than those in the two other groups—were specifically described in our notes as mature and physically well-developed. They were a self-contained lot and able to organize themselves and their environment without apparent effort. The tests themselves exerted considerable pull on these children. Enjoyment of mastery for its own sake pointed to a measure of ego autonomy. It is true that there were isolated drops in performance, but they were offset by top scores in all other areas of performance.

The Superior Achievers displayed advanced linguistic abilities and the most complex sentence structures were found in the stories of this group. Most interesting was their high degree of integrative competence. If one draws a graph showing the number of children in each group—the Failing Readers, Slow Starters, and Superior Achievers who failed representative kindergarten tests—it is clear that the failing kindergarten children's functioning is inferior to that of the youngsters in the two other groups.

The kindergarten protocols of the three groups, if arranged from failing to passing to superior, show a progression from primitive responses in the Failing Readers to differentiated and sharply defined ones among the Superior Achievers. The failing children function at the lower level of perceptual and linguistic organization. It wasn't however, failing on any single task that distinguished the Failing Readers, but rather the severity and the accumulation of deficits. Diagnosis of reading disability does not rest on any single pathognomonic sign, but on appraisal of the whole configuration of dysfunction. These dysfunctions are not necessarily confined to one particular area, to reading readiness tasks such as word matching or letter naming which are either similar to or identical with the reading process itself. Our Failing Readers showed inferior performances in other areas as well. Their failures in human figure drawing, on the Bender-Gestalt and on the organization of stories, reflect dysfunctions which have no apparent or direct relation to reading. All three tasks require ability to integrate parts of the Gestalt into a meaningful whole. In other words, they call for a higher degree of integrative competence, that function of the organism which combines discreet clues to make a unified response possible. Thus, failure or success depended not so much on the specific skills involved, but on the degree to which the task measured integrative ability.

Integrative weakness at kindergarten age seems to augur poorly for reading and spelling at the end of the second grade. We saw positive correlations also between clinical assessment of what is called "ego strength," (the word "grit" describes more or less what we mean) and work attitude on one hand and all achievement measures at the end of the second grade on the other. In other words, those youngsters who, in kindergarten, were unable to put themselves into what they were doing, the dependent, immature children, seemed to do poorly several years later. We feel that physiological and emotional immaturity go hand-in-hand.

The psychiatrist may say that a little boy is unable to learn because he's still psychologically heavily tied to his mother and conflicted about leaving her to the younger children at home. He's probably right, but he might be inclined to overlook the fact that this same youngster's physiological make-up is that of a four or five rather than that of a six and a half year old boy. A remedial worker might say that the little boy's temper tantrums and infantile responses are the result of his failing at school and he may have a very good point. However, the worker might overlook the fact that this youngster still is so fantasy-ridden, so wrapped up in magic dreams belonging to a younger age that he is unable to give of himself in terms of work. In the last instance we always deal with a *total* organism, with a whole child whose developmental lag tends to be pervasive and to embrace all areas of functioning.

In spite of their adequate and often superior intellectual endowment, such children's emotional development, their behavioral patterning, their neurophysiological organization are as undifferentiated and as diffuse and as immature as those of chronologically younger children.

Diagnosis makes sense only if it leads to the formulation of specific educational strategies. The question is what do we do with these children? In the twenties, the school suggested waiting and letting maturation do the job. As a result, the teachers were not particularly concerned, nor were the parents. But the children were. By the time they had reached the end of the second grade they were often severely upset. They clearly realized that they lagged far behind their peers. Schilder said, many years ago, that training plays a part even in those functions of the organism in which central nervous system maturation is of primary importance.

The question, then, is what training and at what level? What is needed clearly is a match between the child's mental level and the type of teaching offered. To admit immature youngsters into first grade where their chances to succeed are slim and where they are exposed to the damaging experience of failure is highly undesirable. We are, therefore, suggesting to the schools to institute small transitional classes between kindergarten and first grade for those children who, regardless of age, are not ready. Training in such transitional classes is carried out in a fairly structured framework. In such a small group the teacher can give massive support to the anxious and dependent youngster who tends to be overwhelmed in a setting that does not provide for individual guidance. The teacher can seat the over-active child in a way that protects him from too many extraneous stimuli. She can provide large motor outlets for the youngster who is yet unable to sit still for any length of time. The transitional class will help the child who is disoriented in space and time. Teaching this type of child the layout of the school, the position of the classroom, the direction in which his room lies may be helpful. Orientation in space starts with the development of a cohesive body

image, becoming aware of the mid-line, establishing left and right discrimination and consistent left-right progression. If disoriented in time, the child will have to participate in the planning of his daily schedule. He will have to find out about the changes in the seasons, the organization of the day, the times of school opening and closing. Temporal organization must start on the non-verbal level. Tapping out patterns on the child's own body in rhythmic exercises are ways to establish organization in time.

Difficulty in verbal communication is at the core of many learning difficulties. Children suffering from maturational lags are action-oriented. They usually have gross lags in understanding and the use of languages. To be able to process and recall information received through auditory pathways is a sine qua non for reading. Nearly all immature children have trouble with auditory discrimination, and much help is needed in this area.

For such children to discriminate between such fine shades of sounds, such as shin, skin, chin and sin, is much too difficult. He will be able to benefit if you show him concrete objects and make him choose between a rock, a block and a lot. Teaching action-oriented children to use words is a slow process. The day when such a youngster first says "stinker" instead of hitting is a red-letter day. Getting up a battle between soldiers and Indians and having the children issue orders is a way of integrating action with speech. It provides an opportunity for the teacher to get across the small grammatical words which represent spatial relationships in a highly motivated setting. The soldiers hide *under* the hedge or the Indians gather *next* to the bridge, etc.

In order to encourage the children to use more elaborate sentence structures, *expansion* is a useful device. The teacher repeats the child's own rudimentary phrases back to him in a slightly expanded and clarified form. Looking at a picture the child will say, "monkey, up." The teacher will come back with, "Yes, the monkey climbs up the tree." He speaks to the child the way the mother has or should have fed her baby sounds and words.

There are children whose test performance indicates that they need help with visual patterning. Teaching, as always, starts on the child's actual level. Visual perception, as I'm sure Dr. Frostig told you, is not a unitary process. One has to start on the ground floor. Some children need extensive figure-ground experience. Puzzling out the parts of two interlocking figure frames is a good thing to do. Children need manipulation of shapes and letters. Research in Russia has shown that small children who are encouraged to manipulate objects did better at recognizing the inter-relation of their parts.

Other children need motor and directional training. A transitional class provides an opportunity to transmit into educational practice the insights gained from a careful scrutiny of a child's weaknesses and strengths in the various areas. Instruction can be geared differentially to each child's weaknesses and strengths in various areas. Instruction is tailored to each child's specific needs.

A few children in such a transitional class can be integrated into the regular first grade after a few week's training. Most others will be able to cope with the demands of formal reading instruction a year later. For a small number of children suffering from severe and specific lags, continuing support for at least two or three years is indicated.

Van Hoosau has called the interval between kindergarten and first grade the "twilight zone of learning." This twilight zone is served in a transitional class. We can no longer afford to wait until children are in trouble. By that time emotional problems related to failure have obscured and complicated the original difficulty. Let me, therefore, make a plea for early identification and early intervention. Thank you.

Dr. Meier: Thank you.

Dr. de Hirsch: Could you hear me?

Dr. Meier: Yes, we heard everything. I think that the people initially had some difficulty in understanding your accent, which I find perfectly delightful.

Dr. de Hirsch: It always happens. I'm so sorry.

Dr. Meier: We have a group here who are largely second grade teachers and many of them come from rural schools where the notion of a transition class is several years down the pike. I'm wondering if you would have any suggestions for them. They have these children. There is no question about that.

Dr. de Hirsch: I think perhaps one thing to do first is to look at the individual child and understand the gaps. Does he understand if you talk to him? Even in the second grade you get a number of children who do not understand any complex verbalization. They can carry out two directions, but if you give them three directions they get lost. They only deal with concrete entities, but anything more is too hard. You don't realize how often children lack spatial and temporal concepts. I see ten and eleven year olds who have trouble with sequencing and serial order. They don't know the months of the year. They don't know the sequence of the days of the week. We have to build larger vocabularies. If a child doesn't know a word, how can it make sense when he reads it? If the child has an articulatory defect and mixes up "sing" for "thing," the sentence doesn't make sense to him. I think one of the primary tasks of a second grade teacher is finding out what are the deficits, where the individual child struggles. Then you get to visual discrimination. The child may have trouble when the print is small. So you start these children with large print and very heavy black letters on a white ground because in this way the figure-ground problem is easier to solve. You see children who have trouble holding the pencil. Obviously, every teacher knows what to do with these children. You give them fat pencils so they can hold them better. Is that more or less what you wanted to know?

Dr. Meier: Yes, these are the kinds of practical things teachers are seeking. We have a question here. She's coming up to the microphone.

Teacher: When should this transition period take place? Is it during the first grade or in the summer like a Head Start program?

Dr. Meier: With regard to the timing of these transition classes; in this area we have very few kindergartens.

Dr. de Hirsch: It might be a good idea to put them before first grade, or, if necessary, a year later.

Dr. Meier: Would you suggest summertime activities? Is that an alternative?

Dr. de Hirsch: Yes, but it is not enough. In some children twelve weeks of intensive training will do the trick. But first, we must make a diagnosis. You pull out the children who have trouble and you train them for twelve weeks and it makes a difference. Some of them need longer, of course, much longer.

Dr. Meier: Fine. I'm going to ask a question that you might address yourself to while our specialist trainees are marshalling some other questions. You and Marianne Frostig have both indicated that the notion of dominance is really not so important as people such as Delacato might be saying it is, and I'm wondering about how these teachers can digest these many panaceas that are offered to them as quick cures?

Dr. de Hirsch: That's an important question. You see, there are no pills. There simply aren't any quick solutions. There aren't in life and there aren't in school or learning. If you'll let a child crawl at age fourteen or put drugs in his food, does that necessarily help his cognitive ability? Some drugs do reduce hyperactivity, of course. Giving the child of four who is somewhat retarded or brain injured a lot of physical activities can only benefit him. It's a matter of age, a matter of the child's need. We don't know enough in general. All I can say about it is that if you get a fast, quick answer on any problem, beware. Parents want it, that's the trouble.

Dr. Meier: They are often so desperate that they will grasp at anything.

Dr. de Hirsch: I am for body image training. I am for training in motor activities. I am for as many rhythmic activities as possible, but in young children only.

Dr. Meier: We have a small group of teachers within our total trainee group who are elementary physical education teachers and we have others who are elementary art teachers. Would you care to relate the motor and body-image training to both physical education and art activities?

Dr. de Hirsch: Let me try. You stand a child against a wall and outline his body for him. Then you let him turn around and he learns where his head is. He learns where the eyes are. You only have to look at the human figure drawings of these children. The arms stick out of the head. The legs stick out of the neck. You know they haven't any idea of where they are in space. After naming the parts of the body, tell them to touch their left eye with their right hand. These are all very helpful. Rhythmic activities will help. Anything which requires organization in space and in time is helpful and benefits body image.

Dr. Meier: In a sense you are talking about body image calisthenics.

Dr. de Hirsch: That's right. That is very helpful. I would never have learned to read without it. I got there by mistake.

Dr. Meier: I now have some questions that have been submitted in writing. When a child appears very intelligent, reads well and so forth, but cannot follow directions, what may help her?

Dr. de Hirsch: I would assume that in this case the child can read mechanically and doesn't understand what she reads. I assume that she is very good in the technical aspects of reading. But if you write down for her instructions, she may not follow because she doesn't understand. I would suggest that the teacher ask the child to repeat the directions and then explain how she plans to carry them out. This will make clear the gaps in understanding.

Dr. Meier: That's right. Another question. Since we have children in the second grade who are very immature, do we pass or retain them? Do they get a feeling of being a failure if they are retained?

Dr. de Hirsch: Yes, this is the very question that is being asked very often. There is some research on it. There is a man upstate who has made a study of retaining children in first grade to see if these children are so thoroughly humiliated and ashamed that they can't function. It turned out that this was not true. While at the moment the retention was a big hurdle, the children very quickly adjusted to the new group and did much better. I think what you have to do is to get the parents on your side. If the parents are willing for the child to repeat, then the child goes along with it and is much more comfortable after a short while. Otherwise he drags along. It's a terrible situation to be always at the bottom.

Dr. Meier: Do you have any suggestions for getting the parent on your side?

Dr. de Hirsch: First of all, it is easy to get the parent when the child has a late birthdate. You can simply say that children born in July, August, September, October have been shown by research to be bright but not ready. These parents can always say that the school has changed their policies.

Dr. Meier: If you have an immature child in the first grade, what about just sending him home and letting him mature a year?

Dr. de Hirsch: That's a perfectly good question. The child will get better if he matures for a year. There's no doubt about it, but I don't think he gets enough help. There isn't a child who cannot improve as long as you put the time and care in it. Of course, you can train a child till the cows come home, and if he's not ready for the training it won't work. If you go down to his level and start there, it helps maturation.

Dr. Meier: That's what prompted the question. I believe that it was a statement that Dolores Durkin made that it might be well to start even earlier with the child who is less mature. What do you think of that?

Dr. de Hirsch: We are now working on tests which will come out in a year or two where we can pick out children who will have learning difficulties at the age of three or four. We do it by way of very sophisticated language and perception motor tests.

Dr. Meier: Is this part of Masland's work?

Dr. de Hirsch: Yes. We are now modifying it and changing it and doing a lot of work on it.

Dr. Meier: We have a question from one of our physical education teachers, who says that you stated that many boys compared to girls at age six are twelve months behind in maturational age.

Dr. de Hirsch: In skeletal frame.

Dr. Meier: Is it possible that these boys and possibly all boys can be started in school at age seven?

Dr. de Hirsch: I think it would be wonderful. I really think so. I think the schools should make this difference. They have started doing this in one or two places. Some schools do have all children start at seven, but I think it is not necessary in girls. Girls, in general, are much more ready than boys.

Dr. Meier: One of the places that is doing this is right here in Greeley. We tried an all male kindergarten with a male kindergarten teacher in an experimental effort to masculinize the traditionally feminine curriculum. These boys, who were not selected at all, did better in mean reading readiness achievement than any other group of boys in the entire district.

Dr. de Hirsch: That's interesting. But you probably had an excellent teacher.

Dr. Meier: That's the real surprise. The teacher was a physical education teacher who had had no elementary education preparation. He just went in and mixed it up with the boys for a year. They read and developed their materials around trucks, road building, sports, airplanes, and that sort of thing.

Dr. de Hirsch: That's an excellent idea. You know all teachers know that boys mature later.

Dr. Meier: We have a question here written in haste and furor. Won't it hurt superior boys?

Dr. de Hirsch: If you have a superior boy it would be silly to hold him back. *But I would like to point out* that intellectual maturity is not necessarily the same as physiological maturity. You see highly intelligent boys with IQs over 130 who really can't hold a pencil. We have a boy with an IQ of 137 who, after a year in first grade and three months in second grade, simply can't remember the alphabet letters. He is highly intelligent. There is nothing you can't talk to him about. However, perceptually and motorically, he is immature.

Dr. Meier: We have a question along the lines of language disorders, namely stuttering. Would you please comment on that condition?

Dr. de Hirsch: I have very different ideas about stuttering. I have a long theory about stuttering which I can't comment on now, but it differs from that of the American Speech and Hearing Association. The best work on stuttering to my mind is by Dr. Wyatt. She has a book coming out, incidentally, and it seems that the American Speech and Hearing Association is about to change its position on stuttering.

Dr. Meier: We'll pass this stuttering problem on for further research. The next question is with regard to the social and emotional complications which are apt to develop for a child who is advanced a year or who skips a grade. Do you have any comment on this?

Dr. de Hirsch: There are a number of children who are advanced intellectually, but not socially or emotionally. They are not necessarily better off if they are pushed into a higher grade. The social gap between them and their peers simply gets wider. There are, of course, youngsters who have very special gifts—for math, for instance. One must provide advanced work for them. In the 10th grade some of them need college courses in their special area, but they may stay with their age group for other subjects.

Dr. Meier: What do you do about the "lazy child" is another question here.

Dr. de Hirsch: First of all, tell me what is a "lazy child?"

Dr. Meier: I'm glad you asked. The person submitting the question means the child will not do any written work, even though he is very intelligent.

Dr. de Hirsch: There are several answers to it. Some children have severe difficulties with written expression and with the mechanics of writing. They may have become phobic in this respect.

Dr. Meier: They just *appear* to be lazy, is that right?

Dr. de Hirsch: True, they suffer from a specific and residual difficulty with composition although they have caught up in reading. There are others who, for psychological reasons, are unable to give of themselves in terms of work. Such children do not work at any projects, they have no hobbies. The ones who really go after their interests in areas outside the academic area and those who do good work in math probably may have a specific difficulty in written formulation and expression.

Dr. Meier: Laziness may be just a label. Please elaborate on the phrase "putting in."

Dr. de Hirsch: Learning is fundamentally an aggressive act. We no longer believe that in order to learn a person just sits and opens his mouth while a teacher pours information down his throat. You have to get the stuff out of a teacher, out of a book, out of a blueprint. You must be actively involved. Some children are extremely passive, dependent and uninvolved. Others are so phantasy-ridden that they are not available. These children do not "put in" either.

Dr. Meier: This dependency syndrome—is there anything a second grade teacher might do to wean a child like that?

Dr. de Hirsch: I think one has to use the child's own interests—*any* interests he has. If it's lizards, the teacher has him read about lizards, dictate stories about lizards, write about them. The point is she must involve the child at whatever cost.

Dr. Meier: This sounds like Sylvia Ashton Warner's approach, using the words and concepts that really mean something to the child.

Dr. de Hirsch: Above all, one must work on a meaningful relationship with the child. Some children need a strong relationship with the teacher as a means of getting involved in subject matter.

Dr. Meier: Do you make a differentiation between the so-called "lazy" child and the underachiever?

Dr. de Hirsch: An underachiever is by definition a child who does not realize his very good intellectual potential. He might have a language disability. He might be so conflicted that he has no psychic energy available for academic achievement. I'm against snap diagnosis and snap cures. You have to study the youngster to find out how he functions.

Dr. Meier: Do you think that the lazy child is one who just couldn't care less?

Dr. de Hirsch: May be. But *why* doesn't he care?

Dr. de Hirsch: You look at a child who's supposed to be stupid. But when you look at his highly differentiated drawings you know that the child is not stupid. He has trouble, but to produce so differentiated a drawing and so beautiful a balanced drawing, he must have something. On the other hand, high ability in drawing does not necessarily mean high intellectual ability. You see what I'm trying to say? Some children come to me who can't take an intelligence test. You look at their drawings and see that maybe he does have more intelligence than he was able to show. On the other hand, looking at a very talented drawing doesn't say that the child does well in arithmetic.

Teacher: Right. I agree with that. But on the first or second grade level where you were discussing the child who produced a poor human figure drawing, say that the child was drawing the figure of a man in what you might categorize as a disassembled form. How far do we carry this correlation between the disability and the normal child?

Dr. de Hirsch: The drawing of a man is a very different thing from other art. I would think the drawing of a man would represent a very special task. You get children who do beautiful drawings of ships and boats and can't draw a man.

Teacher: Right. Well, I was emphasizing the figure drawing which would bring out this disability. There are many teachers who feel that the drawing that the child presents can be used as a tool in evaluating their disability or their achievement level.

Dr. de Hirsch: Yes, the original Draw-a-Man test was designed by Goodenough to measure non-verbal intelligence. If you take a six year old's drawing with any number of details, it's an intelligent child. That's not necessarily true on an older level.

Dr. Meier: Do we have any other comments from the floor?

Here's a question regarding children's art and its relationship to emotional disturbances. What would you suggest along these lines?

Dr. de Hirsch: There are studies by Margaret Naumburg. She's evaluated neurotic and schizophrenic children's drawings.

Dr. Meier: Do you speak of bi-lingual children and their under-achievement?

Dr. de Hirsch: We have a terrible problem with the Spanish-speaking children in New York. They present very complicated problems, because most of the time the performance in any language is weak. It's just as weak in Spanish as in English. Some of these children have a combined vocabulary smaller than the mono-lingual children. I think they need very special consideration and special training in language and in English.

Dr. Meier: It's like English as a first language being taught in the vernacular fashion. Do you recommend teaching English as a foreign language? The teacher is suggesting that you bring it in as a separate subject.

Dr. de Hirsch: You should bring it in *before* the child starts school, at three, four years of age.

Dr. Meier: Somebody just said, "This, in Idaho?" Next is a question from a physical education teacher wondering if you have any references off the cuff regarding what they can do with these disabilities?

Dr. de Hirsch: I do not believe that hopping and crawling at age eleven makes much a difference. I think it is a good thing in young children to develop body image, to develop power over their own body, and rhythmic activities. I don't think it carries over in older children.

Dr. Meier: Are Drs. Kephart, Cruickshank, and Getman legitimate references?

Dr. de Hirsch: I'm sure they are legitimate references.

Dr. Meier: We are looking now for references as to how we can help the bi-lingual child.

Dr. de Hirsch: There is very little work about the help but there is work saying that they have difficulties. I think that getting them together in small groups of six or eight in nursery schools with other children and a good teacher will do an awful lot.

Dr. Meier: You are very keen on the pre-school experience?

Dr. de Hirsch: Yes. By the time they have learned to read it is already late.

Dr. Meier: What would be your reaction to their learning to read in their other language first?

Dr. de Hirsch: I wish they would master English first.

Dr. Meier: I regret to say that the time allotted for this telelecture has elapsed. On behalf of the specialist trainees may I say thank you for a most enlightening and pleasant lecture and dialogue. Goodbye, for now.

Dr. de Hirsch: Goodbye.

WHAT ARE SOME SPEECH AND HEARING CONSIDERATIONS?

JOHN IRWIN

Learning disabilities may be defined in either of two general ways. That is, definition may be on either an *in*clusive or an *ex*clusive basis. If you define on an *in*clusive basis, you relate the behavior in question to specific etiological factors. The key word in an *in*clusive type of definition is *because.* The child behaves the way he does *because* of a specific reason or reasons. But if you define on an *ex*clusive basis, you note that the behavior in question fails to equal a presumed standard in spite of presumed etiological adequacy. The key words in an *ex*clusive type of definition are *in spite of.*

Both types of definitions have been employed in speech pathology. In the *in*clusive sense, for example, we say that a child does not develop oral language because his IQ is less than 30. The IQ factor is presumed to explain the behavior. In the *ex*clusive sense, childhood aphasia is a fine example. As frequently defined, this term asserts that the child fails to develop normal oral language in spite of such assets or adequate intelligence, hearing, motivation, environment, and coordination.

In the *in*clusive definition, then, behavior satisfies expectations; in the *ex*clusive definition, behavior tends to be below expectations.

*Ex*clusive definitions, as used in speech pathology, at least, have never been completely satisfactory. At a fairly obvious level, the difficulty exists in ruling out all possible factors, particularly as it becomes increasingly recognized that etiological factors can interact to such degree as to make their combined effect extremely difficult to predict. At a less obvious level, the examiner must wonder as to the *why* of the behavior if he has ruled out the presumed causes. In this circumstance, he may find it helpful to assume a possible cause even if it is not one that can—at the moment—be established. Thus minimal brain damage is frequently presented as the basis of childhood aphasia even in the absence of neurological evidence to this effect.

Let's look at some of the interactions that may take place between speech and hearing disorders and learning disabilities generally. I shall suggest four possible relationships; these are neither mutually exclusive nor complete. The first possible relationship is that the disorder of speech or hearing may stem from the same cause as the learning disability. An inclusive example would be the child who is deaf. He will have difficulty in learning oral language and will also have difficulties in other learning situations because he does not hear. An exclusive example would be childhood aphasia. This child, by definition, will have difficulty in learning language, and, by experience, may have problems in other kinds of learning as well, in spite of the established adequacy of his intelligence, hearing, motivation, environment, coordination, etc.

A second relationship is that the speech or hearing disability may be an indirect cause of the learning disability. A child who doesn't handle oral language may find the learning experiences at school so emotionally frustrating that he will withdraw psychically from the total situation.

A third relationship can be direct. Oral language is clearly an important tool of learning. If the child has a major oral language difficulty, he will be minus an important tool for learning and may well fail to perform to expectations.

A fourth relationship is that of no relationship. Particularly in mild degree, you may have the one without the other.

I have come to recognize these five parameters of oral communication: ARTICULATION, VOICE, FLOW, LANGUAGE, and HEARING. I shall discuss each of these in turn, beginning with articulation.

Articulation may be defined as the ability to produce at will each of the basic sounds of a language in each of the sound or phonetic combination in which it conventionally appears. As far as spoken English is concerned, some fifty odd sounds or phonemes are usually recognized.

Articulation is the process by which speech is given body. The process of articulation is roughly (but only roughly) analogous to the orthographic symbols of printing or writing. The letters, in units or in grouping, form the symbols. Articulation is basic to a spoken language.

Disorders of articulation are of three chief types: Substitution, Omission, and Addition. A substitution error is characterized by the use of a new sound for the usual sound. Two types of substitution may be recognized. A substitution error of a *standard* type is one in which one conventional phoneme of a language is substituted for another conventional phoneme. Thus, the child who says "*thoup*" for "soup" is making a standard substitution. A substitution of a distortion type is one in which the individual replaces a standard sound with a nonstandard sound. Thus the child who pronounces "soup" with a lateral lisp (that is, with the tongue pressed against the front part of the mouth so that the air stream escapes around the side or sides of the tongue) is using a nonstandard substitution or distortion.

In an articulatory error of an omission type, the individual fails to produce any sound at a conventionalized point. For example, the child who pronounces "soup" as "oup" makes an articulatory error of an omission type.

The third type of articulatory error is that of addition or insertion. In this type, which is not common, the speaker introduces an extra sound as in saying "psoup" for "soup."

Articulatory problems are the most frequent type of communicative disorders.

Articulatory disorders may arise from the same causes as learning disorders. On occasion, the disorder of articulation may produce an indirect or frustration effect. Very rarely, the articulatory disorder may be so severe as actually to interfere with communication and thus serve to reduce classroom participation. Finally, as previously noted, there may be no discernible relationships.

Let us now look at the next parameter, that of voice. Most of us are less informed about voice than we think we are. Voice may be defined as the acoustic stimulus produced at the larynx as perceived after transmission through the pharyngeal, oral, and nasal cavities.

In normal communication, voice has two basic functions: a *communication* function and an *indicator* function.

Voice serves a communication function in three ways: carrier, signal, and supplemental. Voice serves as a carrier and thus makes oral communication more intelligible at greater distances. In English, each of the vowels is custo marily voiced. Although whispered vowels can be recognized by an attentive listener, the identification of a voiced vowel is not only easier but can be accomplished at great distance.

Voice also serves as a signal. Although all the vowels of English are normally voiced, many of the consonants appear as members of a voiced and unvoiced pair. Thus the major difference between /b/ and /p/ is the presence or absence of voice. In this sense, then, voice contributes to the signal function of communication by heightening the identifiability of these consonants. If voice were not used in this fashion, the number of available consonants would be reduced by eight, and the message carrying capabilities of our code reduced.

Voice also contributes to communication by suggesting particular emphases and meanings. This supplemental communication is achieved primarily by variations in pitch, loudness, quality, and in the rate of change of each of these.

In addition to the communication function, voice also serves as indicator function. Specifically, the voice gives rich indication of the cultural background of the speaker; of his age, sex, and physical health; and, finally, of his psychological adjustment.

Disorders of voice may be classified on the basis of pitch, quality, or loudness. Let us now review the relationships between abnormal vocal function and learning disabilities. Voice is not one of the more closely related parameters. Nevertheless, a voice disorder can stem from the same cause as a learning disorder. An unusual pitch can result in emotional reactions. A voice disorder of inadequate loudness can interfere with participation in certain learning situations. Finally, we may have no relationship.

The third parameter is flow. Flow may be described in several ways. Thus, *rate* expresses one dimension of low. Rate, of course, refers to the number of words or ideas which an individual expresses per unit of time. We have slow and rapid speakers. In general, our society is quite tolerant of variations along this dimension. Only as the extremes of rate are approached do these variations ordinarily receive clinical attention. In the next group conversation in which you participate, notice the wide variation in rate.

Rate, as already noted, may be measured in sounds or words per unit of time. The perception of rate is, in general, positively correlated to this unit of measurement.

Another dimension of flow is that of fluency. *Fluency* refers to the smoothness of progression. Three key characteristics of dysfluency are (1) repetitions of previously spoken sounds, words, or phrases and (2) prolongations of sounds or words, and (3) unusual silences. In normal progression there is, of course, some repetition, some prolongation, and some pausing. The tolerance of our culture

for these manifestations of nonfluency varies. Perhaps, in the most simple terms, tolerance may be said to be related to expectations. Thus we expect the three-year old child to repeat more sounds and words than we expect from the thirty-year old adult. Clinically, the speech manifestation most closely related to problems of fluency is usually known as stuttering. Definitions of stuttering strictly in terms of fluency or dysfluency is usually not sufficient.

A third attribute of flow relates to *order*. Sound should follow sound and word should follow word in accepted or usual patterns. Reversals, or other permutations of order, are perceived as unusual. Clinically, people who have unusual reversals and disorders of order, particularly if these are accompanied by high rate, may be known as clutterers.

What are the relations of disorders of flow to learning disorders? Each can stem from the same cause. There could be emotional involvement. In a few instances the child's stuttering may be so severe as to prohibit effective communication and thus interfere with learning. Probably the most usual relationship is the emotionality which frequently accompanies the act of stuttering.

The fourth parameter is that of language defined as including the sounds and words of a language and the rules of their usage. A speech pathologist tends to be concerned with children who have abnormal language development. We have used two of three measures. One is vocabulary size; another is factors of usage such as response length and complexity; another is relevance or appropriateness of language. A child may be considered abnormal if his vocabulary is either reduced for his age or if he uses words differently from the norm. He may be abnormal if his utterances are shorter than the usual or less complex than the usual. This particular parameter relates very closely to learning disabilities. In an inclusive sense, we are now recognizing that cultural deprivation can produce language differences that make the learned language an almost different or second language from English as it is ordinarily spoken. It can also produce learning variations that are so bizarre as to be unexplainable as to conventional backgrounds. In an exclusive sense, we frequently hold that minimal neurological damage is responsible for both language disturbances and learning disturbances. As far as indirect relationships are concerned, there is nothing more frustrating than not being able to use language in conventional classroom relationships.

The fifth parameter, hearing, may be defined in two ways. It is defined first in terms of acuity, the ability to detect the presence or absence of a sound. The other measure of hearing is usually termed discrimination, which is the ability of making meaningful use of differences among sounds.

At the abnormal level, we may have children who are defective in acuity. They can't detect the presence of a sound as effectively as their normal peers. Acuity is measured on a puretone audiometer. Discrimination is usually tested in terms of speech. Hearing is a parameter that is closely relating to learning disorders. Each may stem from the same cause. The child who has a high fever as an infant may end up with a hearing loss or a learning disability. He may be frustrated by his inability to understand sound. The child whose auditory input is closed cannot compete with the child whose input is open. Hearing is one of the more vital of the parameters.

Let's go through these same five parameters in terms of standards that you may expect at the second grade level. I am torn between two conflicting goals. One is to give you standards that are clear enough that you can apply them reasonably and the other is to give you standards that are accurate enough that neither you nor I will be ashamed of them. I have tried to steer the middle ground between the straight forward statement and reasonable accuracy.

If you are going to test articulation you should test it in two ways. Give the child a picture or an object and let him identify it spontaneously. Examples are a wagon, a hammer, and a pencil. But you should verify your findings by actually talking with the child. Articulation should be adult by age eight and be approaching adult by age seven. There is little sex difference at this age, but girls are slightly ahead of the boys.

Voice may be tested either by the use of pictures, reading, or conversation. By age eight, the voice should be easily audible. There should be no evidence of adolescent pitch change. The signal function of voice should be completely mastered by this time; voicing and unvoicing of the sounds of English should be accomplished in an adult fashion. A hoarse quality may well be outgrown by adolescence, but it can be a sympton of important pathologies if chronic. If you do have a child whose voice is chronically hoarse, refer this child for professional advice.

Flow may be tested by reading or conversation. Stuttering in particular, is better tested by conversation than by reading. Look for evidence of the child's reaction to his speech or any evidence of other children's reactions. Look for the repetitions the child uses. If you become suspicious that a child is non-fluent, check him against at least two other children, tabulating the number of times all three block or repeat or are silent. You may find that the child does it no more than the other two.

All kinds of tests of written language exist, but we don't have any neat measures of oral language. I suggest that on all informal basis you use as a stimulus a picture that has non-educational subject matter in it, such as a bridge with sky and trees showing. You should be interested in the vocabulary the child uses describing the picture. You should know that at this age there shouldn't be much difference between boys and girls. The higher socio-economic background of the child will enable him to do better.

Above age five, sentence length and vocabulary need have little relationship to intelligence. Count the length of a typical response. At age seven, a typical response is about seven words. At age eight, it is eight. Take the five longest of several responses and average the number of words in them. The seven year old is likely to have about thirteen words as an average and the eight year old about fourteen. To test complexity, you may make some recordings of some of the child's responses and count the number of incomplete responses, simple sentences and complex sentences. The child should be using a great number of declarative sentences and some complex sentences.

It is very difficult for the classroom teacher to evaluate hearing adequately. First, permit me to make some comments that may help you to interpret the report from the audiologist or otologist. The hearing mechanism is generally

classified as having three diversions: the outer, middle, and inner ears. The outer and middle ears convert the pressure variations of the spoken language to mechanical movements; the inner ear converts these mechanical movements to neural stimuli. T e brain interprets these neural stimuli and may achieve an approximation of the original message.

Two major types of hearing disorders are recognized. One type is associated with mechanical defects of the outer and particularly the middle ear; the second type, with defects of the inner ear and associated eighth nerve passageways.

Defects of the first type, that is of the middle ear, are referred to as conductive. This term suggests, of course, that the middle ear is no longer serving as a good conductor of mechanical impulses to the inner ear. Conductive defects do not ordinarily produce complete deafness but only a reduction in hearing.

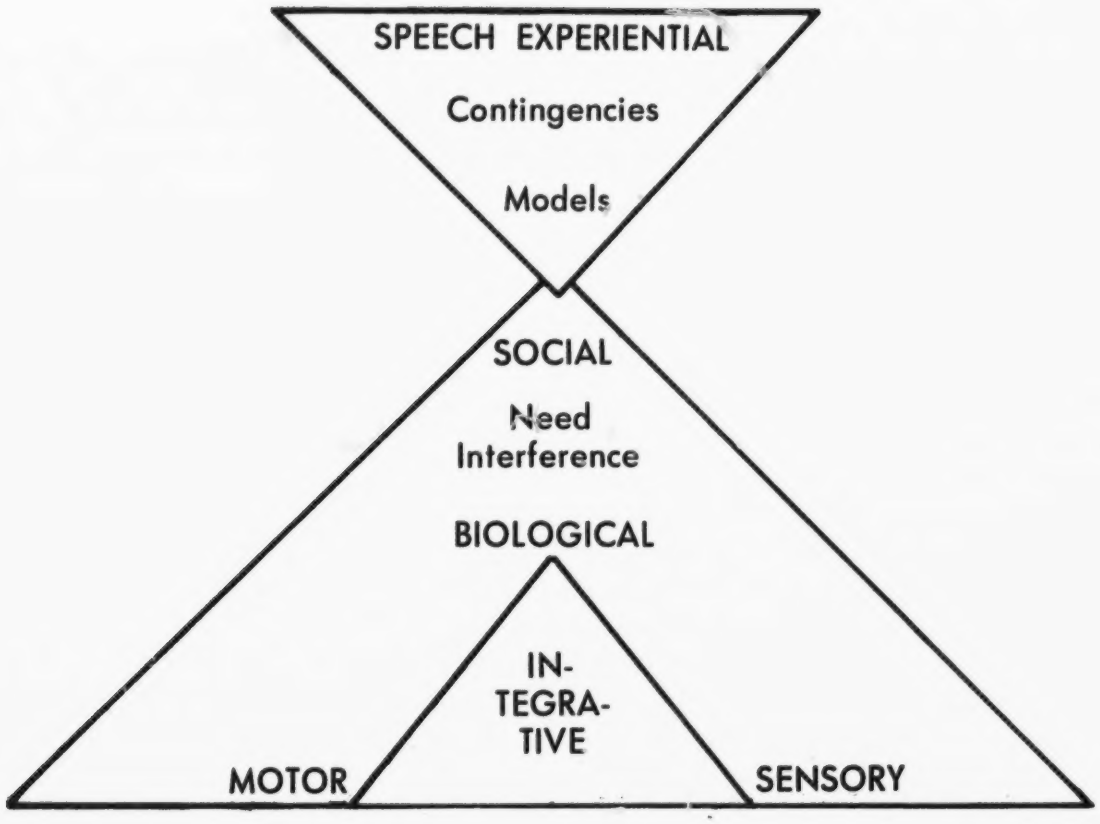
The second type of hearing loss was, traditionally, referred to as perceptive loss. Perceptive losses could be complete (total deafness) or partial. Today, however, perceptive losses are classified in greater degree.

Conductive losses originate in the outer and/or middle ear. Thus a child may have wax in his ear, or the three little bones in the middle ear may not vibrate. In conductive conditions, the loss tends not to be the same at all frequencies, the loss may be severe or even complete, and the speech discrimination may be down.

Here are some behavioral observations which you, as teachers, can make with respect to hearing loss. First, in conductive types of loss, the child is very likely to talk in a soft voice and will understand loud speech. If there is background noise and you talk loudly, he will hear you; but if you talk softly, he may have trouble hearing you. Finally his hearing may fluctuate from time to time, in particular when he has colds. The sensorineural type of loss is likely to show a different type of behavior. He is likely to have a louder than average voice. Because his discrimination speech is poor, he is more likely to distort certain sounds. He may be disturbed by sudden loud noises. His ability to follow conversation will be somewhat unpredictable. The ability to discriminate speech increases with age but begins to slow down by age five and by age eight native discriminatory ability does not tend to improve.

In summary, this is a most compressed statement of examination technique. More training would, of course, be necessary if you are to do such testing. These statements simply suggest some possibilities.

The development of oral communication is dependent upon the interaction of certain biological, social, and speech experiential factors. These are shown below.



TRIPARTITE BASIS OF HUMAN COMMUNICATION

As you can see in the bottom portion of the diagram oral communication has a physical basis. The three physical elements are motor, integrative, and sensory. In order to develop the speech normally, the child must have full motor control of his nose, mouth, throat, larynx, and respiratory apparatus. At the same time, the child must have normal sensory input. In particular, he must be able to hear his own speech and that of others, he must be able to feel the contacts and movements within his body as he talks, and, to a somewhat lesser degree, he must be able to see the world around him. Finally, he must be able to integrate the meaning of communication with the internal and external sensations and with the motoric acts of speech. Many conditions which affect speech may require clinical help because they interfere with the biological basis of speech. Examples of such conditions include cleft palate, cerebral palsy, and hearing loss.

The socializing experiences of the developing individual are represented at the second level of the figure. Our best current evidence indicates that the human infant is born with considerable capacity to learn to talk. If he has a normal social development, the human infant will enjoy talking and find the contingencies

of talking rewarding. On the other hand, abnormal social development of the infant and child will delay, distort, or even stop the development of speech in the child. Thus certain kinds of abnormal psychological reactions may cause the child to reject the ordinary rewards of society for speech. Again, his social development may be so unusual as to make abnormal speech rewarding in and of itself. In such instances, he may be said to need defective speech. Thus, either on an interference or need basis, abnormal social development may interfere with speech development.

The inverted triangle above the large triangle reflects the importance of actual speaking experiences in the development and maintenance of speech. This top triangle asserts that if the physical and social bases for speech are adequate, then normal speech will be developed and will be maintained if the models to which the child is exposed are normal and if the contingencies which result from his speech follow the accepted cultural schedules. Conversely, this small triangle asserts that irrespective of the basic physical and social status of the child, abnormal speech models of abnormal speech contingencies may result in abnormal speech development.

In assuring the development and maintenance of normal oral communication, many professions have primary roles to play. The physician and dentist are primarily concerned with the maintenance of an adequate physical basis for communication. The clinical psychologist and psychiatrist are primarily concerned with the maintenance of proper social adjustment. The speech pathologist and audiologist are primarily concerned with modifying either the communication models or the communicative contingencies which the child or adult receives.

The ways in which a child may learn a new response are through straight verbal instruction, stimulus variation, shaping, and imitation. Stimulus variation involves changing the total situation or parts of the situation in which the child finds himself in order to get the responses you want. An example is the child who will not talk audibly. You tell him to talk more loudly and you promise him various rewards and he still won't talk more loudly. You may be able to get him to talk more loudly by varying the situation. One way of varying it is to simply put a tape recorder in the room and play some music so that he has to talk above the music. Another way is to work with him in a hall where he is thirty feet away from you.

Shaping is a term that has come out of operant psychology. It involves the modification of behavior by rewarding that behavior that is of the kind you want. Suppose you wanted to teach a pigeon to look to the left. You would put him in a box in which it is possible to dispense pellets of food. If you had the pigeon in such a box, anytime he started to look to the left you could release a pellet. The pigeon, finding himself reinforced by the food, would eventually end up by looking to the left.

Imitation is one of the most under-rated techniques of instruction. Only recently have psychologists begun to study imitation well. They are coming up with techniques that enable us to stimulate it and control it. For example, Bandura has studied the imitation of socially aggressive behavior.

The following description conveys some impression of the sense of Bandura's work. A child is given an "accidental" chance to watch a TV show, which is

actually a small tape prepared in advance. In the film a child is playing with some toys. A bad boy comes into the scene and begins to mutilate the toys of the good boy. At this point, the good boy rises in righteous anger and turns on the bad boy. Up to this point, every child sees the same film, but there are two endings. In ending one, the bad boy is in control of the situation, including the toys. In ending two, the good boy triumphs and the bad boy leaves in disgrace. The child sees one of these two versions and is quickly placed in a room with the same toys and the same kind of situation. The child will imitate the aggressor more if he saw the agressor win than if he saw him lose.

We're now able to formulate some general principles that make for good imitation. Some are that you will imitate a model with whom you can identify with or can respect. You will imitate one whose own behavior was rewarded. You will imitate if you are told to do so. Imitation is a class of behavior. It is possible to teach a child to imitate generally. If imitation can be taught as a class of responses, you will not need to teach specific kinds of imitation. The evidence is accumulating rapidly that we are going to be able to teach imitation.

In real life, two kinds of shaping must take place. You must shape the original repertory of responses so that they become like those of adult society. You must also shape the reactions of a child so that he will react positively to the usual rewards of society. We don't know that women are born wanting to wear mink although I think that is actually true. Society must have an organized set of contingencies or rewards.

What is actually learned in terms of oral speech? Oral speech is a neuromuscular habit which is monitored indirectly by the ear. When you make a speech response, you will receive many stimuli. You will hear yourself and will get some touch stimulus your lips touch. You will also get some proprioception stimuli in feeling your jaws separate. The final product is a speech sound.

In speech pathology we used to spend a great deal of time listening and then describing the error. Certain aspects of speech affect the listener and can be described functionally. With the advent of B. F. Skinner, it became increasingly obvious that the listener responds and that certain aspects of this response modifies the speaker. We now believe that the things that control a person's speech are the effects of that speech on him. The only two aspects of voice, for example, that seem seriously to affect our culture are not being able to hear and a pitch that is too high for a man or too low for a woman so that the hearer can't tell which sex is speaking.

QUESTIONS

1. *What keeps a response functional?* Responses will stay if the quality of the response is within normal limits, and if the individual has been socialized so the rewards are positive and responses are reinforced.

   We cannot change speech patterns if the environment of the child will not reward the change.

   It is difficult at certain ages to get boys to change their voice tone.

It might be better just to concentrate on the spelling of a word, if the sole reason for altering speech is to teach spelling.

2. *When does auditory discrimination mature?* Physiological maturation for auditory discrimination occurs at about age eight, but it is not impossible to teach additional discriminatory skills after this age.

3. *Why do we have a higher percentage of boy stutterers than girls?* We do not know. There is no agreement. One explanation has been that the cultural expectation of the male has been more difficult.

4. *What causes stuttering?* There is no particular agreement as to what causes stuttering. The only agreement is that there may be multiple causes. Some authorities feel that we must talk about individual stutterers rather than stuttering in general.

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